

I Claim:

1        1.     Apparatus for sensing temperature of an object in contact with a  
2 reference surface, the apparatus comprising:  
3              a sensing element resiliently mounted within a recess in the reference surface  
4              to contact an object disposed on the reference surface;  
5              photoluminescent material disposed on the sensing element to emit luminous  
6 flux in response to energetic excitation thereof; and  
7              an optical channel having one end positioned relative to the sensing element  
8              to transfer luminous flux therebetween, and having an opposite end disposed to  
9 optically couple to optical analysis apparatus for sensing luminous flux supplied  
10 thereto from the optical channel.

1        2.     Apparatus as in claim 1 including a substantially planar spring  
2 disposed within the recess of substantially cylindrical configuration to resiliently  
3 support the sensing element in substantially coaxial orientation within the recess.

1        3.     Apparatus as in claim 2 in which the spring is configured as a disc  
2 disposed within the recess substantially co-planarly with the reference surface for  
3 resiliently supporting the sensing element to produce resilient force thereon in a  
4 direction toward the reference surface which increases non-linearly with deflection  
5 away from the reference surface.

1        4.      Apparatus as in claim 2 including photoluminescent material disposed  
2      on the sensing element for emitting radiant flux with an intensity characteristic that  
3      is indicative of temperature in response to stimulation thereof with radiant energy;  
4      and including

5              an optical channel having a proximal end disposed near the sensing element  
6      for transferring radiant flux between the proximal end and a remote end of the  
7      optical channel.

1        5.      Apparatus as in claim 4 in which the optical channel includes a first  
2      portion adjacent the proximal end, and a second portion adjacent the remote end;  
3      and including

4              a coupling structure disposed intermediate the proximal and remote ends for  
5      selectively optically coupling together the first and second portions of the optical  
6      channel.

1        6.      Apparatus as in claim 4 including analyzer apparatus optically  
2      coupled to the remote end of the optical channel for selectively supplying  
3      successive pulses of radiant energy thereto and for receiving via the optical  
4      channel during intervals between pulses the radiant flux emitted by the  
5      photoluminescent material in response to pulses of radiant energy supplied thereto.

1           7.     Apparatus as in claim 6 in which the analyzer apparatus responds to  
2     the characteristic of rate of change of intensity of radiant flux emitted by the  
3     photoluminescent material on the sensing element to determine the temperature  
4     thereof.